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OZONE FILLED VISCOSE MATERIAL AND PRODUCTION DEVICE THEREOF

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[There are no amendments to this patent.]

Abstract

Problem

To provide an ozone-filled viscose material which continuously maintains the effect of the ozone such as disinfecting ability, etc., over a long period of time and a production device thereof.

Means to solve

Ozone-filled viscose material production device (1) of the present invention has ozone generator (11) which generates ozone, container (3) for filling high-viscosity material (4), ozone feed pipe (18) which extends into container (3) from ozone generator

(11), and agitators (13), (14), (15), (17), and (19) which agitate high-viscosity material (4) within container (3).

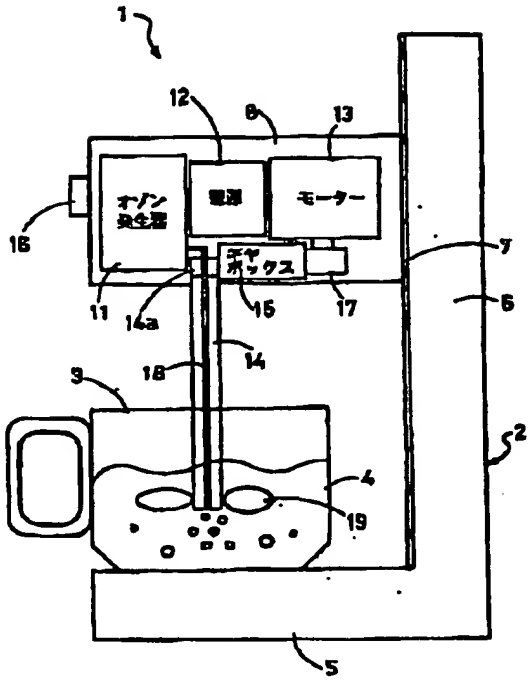

Figure 1

Key: 11 Ozone generator
12 Power source
13 Motor
15 Gear box

Claims

1. An ozone-filled viscose material characterized by the fact that ozonized gas of concentration 0.01-500 ppm was filled

with respect to a high-viscosity material in which the viscosity is
$1\text{-}10^6$ Pa·sec by dissolving or composing into microbubbles.

2. An ozone-filled consistent body, characterized by the fact that in the ozone-filled viscose material noted in Claim 1, said high-viscosity material is a cleansing cream, massage cream, toothpaste, ointment for wounds, and paste for coating.

3. An ozone-filled consistent body, characterized by the fact that in the ozone-filled viscose material noted in Claim 1, the composition of said high-viscosity material is a simple substance in one or a mixture in optionally combination of propylene glycol, polyethylene glycol, triethanolamine, glycerine, petrolatum, tocopherol acetate, dibutylhydroxytoluene solution, edetate solution, sorbitol, Irish moss, karaya gum, methylcellulose, and carboxymethylcellulose sodium solution.

4. An ozone-filled consistent body, characterized by the fact that in the ozone-filled viscose material noted in Claim 3, a coloring material and a preservation material are added which do not have high reactivity to the ozone to the high-viscosity material having said composition filled with ozone.

5. An ozone-filled viscose material production device characterized by the fact that it has an ozone generator which generates ozone, a container for filling a high-viscosity material, an ozone feed pipe extended into said container from said ozone generator, and an agitator which agitates the high-viscosity material within said container.

6. An ozone-filled viscose material production device characterized by the fact that in the ozone-filled viscose material production device noted in Claim 5, said agitator has a

of as ozonized water by dissolving in water
ozonized water, Japanese Kokai Patent Applic
5[1993]-123264 has been disclosed. Figure 4
perspective view showing a halitosis elimina
in said gazette. In this halitosis eliminati
discharge nozzle (51) attached via a flexibl
water discharge unit (52) and attachment scr
basin, etc., is provided to the bottom part
Water flow connection tube (54) for hot wate
provided to pass through the hollow part of
part (53). On the other hand, heat exchanger
control part (57) provided separately from w
(52) are stored within the case. Solenoid va
executes introduction/cutoff of city water,
body to said heat exchanger (56) and is conn
generator (60) via water flow connection pip
electric control part (57) is connected to t
etc., of water discharge unit (52) and openi
of solenoid valve (58).

[0004]

Ozone generator (60) is constituted of
the upsteam side is connected to heat exchar
flow connection pipe (59) as was noted above

[0003]

As that which utilizes ozone, ozone is

ng/closing mechanism

a box-shaped body;
nger (56) via water
e, and the downstream

6

generally used as gas
As that which uses
cation No. Hei
is an external
cting device disclosed
ng device, water
e tube is provided to
ew part (53) to wash
of the case thereof.
r and wiring (55) are
said attachment screw
(56) and electric
ater discharge unit
lve (58) which
is composed as one
ected to ozone
e (59). Also,

[0003]

As that which utilizes ozone, ozone is generally used as gas or as ozonized water by dissolving in water. As that which uses ozonized water, Japanese Kokai Patent Application No. Hei 5[1993]-123264 has been disclosed. Figure 4 is an external perspective view showing a halitosis eliminating device disclosed in said gazette. In this halitosis eliminating device, water discharge nozzle (51) attached via a flexible tube is provided to water discharge unit (52) and attachment screw part (53) to wash basin, etc., is provided to the bottom part of the case thereof. Water flow connection tube (54) for hot water and wiring (55) are provided to pass through the hollow part of said attachment screw part (53). On the other hand, heat exchanger (56) and electric control part (57) provided separately from water discharge unit (52) are stored within the case. Solenoid valve (58) which executes introduction/cutoff of city water, is composed as one body to said heat exchanger (56) and is connected to ozone generator (60) via water flow connection pipe (59). Also, electric control part (57) is connected to the display mechanism, etc., of water discharge unit (52) and opening/closing mechanism of solenoid valve (58).

[0004]

Ozone generator (60) is constituted of a box-shaped body; the upsteam side is connected to heat exchanger (56) via water flow connection pipe (59) as was noted above, and the downstream

side is connected to water flow connection pipe (54) and coupled to water discharge unit (52). Also, ozone feed pipe (61) is fixed to this ozone generator (60) by penetrating the top part of the body and one end thereof is immersed in the hot water within the body. On the other end side leading out to the outside, an ozone generating mechanism comprised of a discharge electrode, a dielectric electrode, and an external high-frequency high-voltage power source is composed within the pipe thereof, and air is fed via the other end into ozone feed pipe (61) from an air pump, not shown in the figure.

[0005]

The conventional halitosis eliminating device composed of said constitution attaches water discharge unit (52) to the wash basin by integrating attachment screw part (53). Then, city water flows into heat exchanger (56) by opening/closing solenoid valve (58) according to electric control part (57); the city water heated here becomes hot water, flows through water flow connection pipe (59), and is fed into ozone generator (60). Ozone is generated within ozone generator (60), this ozone is discharged into the hot water stored within the body according to the air fed to ozone feed pipe (61), and ozonized water is obtained by adding the ozonized gas the hot water. The ozonized water produced by ozone generator (60) is fed to water discharge unit (52) via water flow connection pipe (54), and here, ozonized water fed to water discharge unit (52) according to the operation of water discharge nozzle (51) is jetted. Consequently, the jetted ozonized water enters into the oral cavity, and

elimination of halitosis becomes possible by executing oral cavity disinfection and by oral cavity cleaning of superior sanitation.

[0006]

Problems to be solved by the invention

However, ozone was used as a gas or used by dissolving in water, so though the effect of the ozone can be obtained, there was an inconvenience in the utilization thereof due to it dissipating immediately in the case of the gas. In the case of ozonized water the same can be said even with regards to ozonized, water and though the half-life is slightly longer at about 30 min being dissolved in water, it is not possible to preserve it by maintain the disinfecting ability for a long period of time. Consequently, it did not overcome the demerit of the utilization being inconvenient. Also, when ozone is used as gas or in ozonized water in which ozone is dissolved in water, there is a problem even in the fact that the application is restricted with respect to use as a gas or a liquid as well as not being able to preserve it for a long period of time. Namely, when ozone is used as a gas, there are uses of only adsorbing or spraying due to its dissipating immediately, and when an ozonized water in which ozone dissolved in water is used, it is restricted to use by argling, washing off, or immersing due to its lack of fixation property.

[0007]

Therefore, the present invention aims to provide an ozone-filled viscose material which continuously maintains the effects of the ozone such as disinfecting ability, etc., over a long period of time in order to solve said problems.

[0008]

Means to solve the problems

The ozone-filled viscose material of the present invention is characterized by the fact that an ozonized gas of concentration 0.01-500 ppm was filled with respect to a high-viscosity material in which the viscosity is 1-10^6 Pa·sec by dissolving or composing into microbubbles. Also, in the ozone-filled viscose material of the present invention, it is preferable for said high-viscosity material to be a cleansing cream, massage cream, toothpaste, ointment for wounds, and paste for coating. Also in the ozone-filled viscose material of the present invention, it is preferable for the composition of said high-viscosity material to be a simple substance in one of or a mixture which optionally combined propylene glycol, polyethylene glycol, triethanolamine, glycerine, pertrolatum, tocopherol acetate, dibutylhydroxytoulene solution, edetate solution, sorbitol, Irish moss, karaya gum, methylcellulose, and carboxymethylcellulose sodium solution. Also, it is preferable for the ozone-filled viscose material of the present invention to add a coloring material and a preservation material which do not have high reactivity to the

ozone to the high-viscosity material having said composition filled with ozone.

[0009]

On the other hand, the ozone-filled viscose material production device of the present invention is characterized by the fact that it has an ozone generator which generates ozone, a container for inputting a high-viscosity material, an ozone feed pipe extending into said container from said ozone generator, and an agitator which agitates the high-viscosity material within said container. Also, in the ozone-filled cosistent body production device of the present invention, it is preferable for said agitator to have a speed changing means which changes the operating speed of the agitating operation.

[0010]

Embodiment of the invention

Next, an embodiment of the ozone-filled viscose material and the production device thereof related to the present invention will be explained by showing figures. First of all, the ozone-filled viscose material production device (hereafter referred to simply as "production device") which feeds ozone-filled viscose material will be explained. Figure 1 is a conceptual diagram showing the constitution of the production device. Production device (1) in this embodiment produces ozone-filled viscose material by filling high-viscosity material (4) into container

(3) such as a cup, etc. which is independent from main body (2) and agitating high viscosity material (4) within said container (3). The concrete constitution thereof is that in main body (2), rail (7) is formed to support pillar (6) erected perpendicularly with respect to horizontal stage (5) for placing container (3) and is constituted for drive part (8) engaged with said rail (7) to move support pillar (6) vertically. Movement of drive part (8) can be executed manually or can be moved in connection with a switch to be discussed later.

[0011]

On the other hand, ozone generator (11), which generates ozone, is internalized in drive part (8). This ozone generator (11) is comprised of a discharge electrode, a dielectric electrode, and an air pump which feeds air with respect to the ozone generator which generates ozone and is composed from an external high-frequency high-voltage power source (12). Also, gear box (15) interposed between motor (13) and rotating shaft (14) suspended from drive part (8), motor (13), and power source (12) are internalized in drive part (8). Power source (12) feeds power to motor (13) and ozone generator (11); it can be a battery, or it can be what is connected to an external power source via a plug. If drive part (8) elevates rail (7) with an elevating means not shown in the figure composed within main body (2), power to said elevating means is also fed. This power source (12) is connected to power switch (16).

[0012]

High-speed motor of 225 W is used as motor (13) and the gear within gear box (15) provided with multiple gears capable of conducting by the changing speed of the rotation of motor (13) in 6 stages is interlocked with drive gear (17) at the extreme end of the rotating shaft thereof. Gear part (14a) of rotating shaft (14) is engaged with said gear box. Rotating shaft (14) is supported rotatably in a state of having been suspended from drive part (8), and ozone feed pipe (18) connected to the ozone discharge port of ozone generator (11) is inserted in the shaft center part thereof. However, ozone feed pipe (18) is loosely inserted within rotating shaft (14) and is not rotated according to the rotation of rotating shaft (14). Also, screw (19) is fixed to the bottom end of rotating shaft (14). Incidentally, Figure 1 is a diagram which shows a case when drive part (8) is at a position of bottom dead center, but in this case, namely, during the production of an ozone-filled consistent body, it is composed for drive part (8) to descend rail (7) to a position such that screw (19) at the bottom end of rotating shaft (14) penetrates high-viscosity material (4) filled within container (3). On the other hand, when drive part (8) has ascended rail (7) and is positioned at top dead center during nonproduction, screw (19) at the bottom end of rotating shaft (14) is at a noninterfering height, so that container (3) can be removed.

[0013]

In production device (1) of this applied mode composed as noted above, ozone-filled viscose material is produced as

follows. First of all, container (3) filled with high-viscosity material (4) is placed on stage (5) so as to be positioned directly below screw (19) of main body (2). Then, rail (7) is slid and lowered by applying a load downwards with respect to drive part (8). For this, while checking the position of screw (19) which descends along with drive part (8), a load is applied and is stopped where the screw (19) is immersed into high-viscosity material (4) within container (3). On the other hand, if an elevating means is built in, screw (19) is lowered along rail (7) to the bottom dead center to be immersed into high-viscosity material (4) within container (3) by power switch (16) provided to drive part (8) being turned ON. Then, when high-viscosity material (4) is sensed by the sensor at the point in time at which descension is made, for example, to the bottom dead center, agitation of the filled ozone as is discussed below is executed.

[0014]

Then, by power switch (16) being turned ON after lowering drive part (8) manually, ozone generator (11) and motor (13) conducted to power source (8) are driven. Therefore, in ozone generator (11), ozonized air is discharged according to the air from the air pump via the ozone generation part comprised of a discharge electrode, a dielectric electrode, and an external high-frequency high-voltage power source. The ozonized air discharged from zone generator (11) is discharged from the opening at the extreme end via ozone feed pipe (18). The opening of said ozone feed pipe (18) is immersed in high-viscosity

material (4) as shown in the figure so the ozonized air is fed into high-viscosity material (4) without dissipating into the atmosphere. The concentration of the ozone fed thus is 0.01-500 ppm as the concentration in ozone generator (11). The dissolved ozone concentration changes according to the liquid viscosity of high-viscosity material (4), so it is regulated with the concentration immediately after generation.

[0015]

Also, motor (13) is driven simultaneously with the feeding of the ozonized air from ozone generator (11). The rotational output of motor (13) is transmitted to rotating shaft (14) via the gear in gear box (15) interlocked with drive gear (17). At this time, the rotational speed (100-20,000 rpm) is determined according to the gears within gear box (15) which are interlocked with gear part (14a) of rotating shaft (14) and drive gear (17). Gear selection is made by changing over with a speed changing switch not shown in the figure and is determined based on the viscosity, etc., of high-viscosity material (4).

[0016]

Incidentally, the ozone-filled viscose material produced by this production device (1) uses a high-viscosity material in which the viscosity is 1-10^6 Pa·sec as high-viscosity material (4) thereof. As the high-viscosity material included in this

viscosity, cleansing cream, massage cream, toothpaste, ointment for wounds, paste for coating, etc., which are used generically pertain. Production device (1) in this applied mode provides the biological activating function, decoloring ability, deodorizing ability, and disinfecting ability of ozone by filling ozone in said cleansing cream, massage cream, toothpaste, ointment for wounds, paste for coating, etc.

[0017]

Therefore, as said cleansing cream, massage cream, etc., filled with ozone, a high-viscosity material which is nontoxic with respect to the human body in everyday living and can maintain the effect of said ozone continuously is the target. Specifically, the composition thereof is a simple substance of or a mixture in optional combination of propylene glycol, polyethylene glycol, triethanolamine, glycerine, petrolatum, tocopherol acetate, dibutylhydroxytoulene solution, edetate solution, sorbitol, Irish moss, karaya gum, methylcellulose, and carboxyethylcellulose sodium solution. Also, coloring material and preservation material (paraben, etc.) are added with respect to the ozone-filled viscose material produced by production device (1) based on a condition of not having a high reactivity with ozone.

[0018]

Namely, high-viscosity material (4) composed of an optional composition according to production device (1) constituted as noted above is filled within container (3) and produces an ozone-filled viscose material by ozone being simultaneously agitated with the rotation of screw (19) and being made into microbubbles, namely, cleansing cream, massage cream, toothpaste, ointment for wounds, paste for coating, etc., in which ozone has been filled by being made into microbubbles are produced. Rotation of screw (19) is about 10-30 per sec.

[0019]

The ozone-filled viscose material produced thus is used for the following applications. Figure 2 is a figure showing a state of having applied an ointment which is an ozone-filled viscose material filled with ozone by being made into microbubbles to a wound, an inflamed area, a skin surface, etc. As shown in the figure, ozone-filled viscose material (21) is applied to skin surface (23) by being left filled with ozone (22) and disinfecting function, etc., to be discussed later are manifested. Figure 3 is a figure showing a state of having used a toothpaste filled with ozone made into microbubbles. Namely, toothpaste (31) used for toothbrushing manifests effects such as disinfecting function to be discussed later by toothpaste (31) being agitated further on the surface of teeth (32) according to brushing with a toothbrush and the frequency at which ozone (34) contacts the teeth (32) and gum (33) being increased.

[0020]

Therefore, the ozone-filled viscose material produced thus can obtain various effects in various applications indicated below. For example, in relation to cosmetics targeting the face, the chest, and the entire body, it is effective as a disinfecting means with respect to the face such as pimples, rashes, etc., anti-inflammatory means after sunburn, tissue activating means with respect to the skin, etc. Also, in relation to dentistry targeting teeth and within the oral cavity, it is effective as a decoloring means with respect to the teeth, deodorizing means with respect to halitosis, tissue activating means, anti-inflammatory means, disinfecting means after tooth extraction/surgery, tooth decay, periodontitis, abrasion, angular stomatitis, etc., by using a toothpaste, an ointment for wounds, etc., filled with ozone. Also, in relation to medicine which targets skin disease and wounds, it is effective for disinfecting, anti-inflammation, deodorizing, decoloring, or tissue activating with respect to various skin diseases or disinfecting, anti-inflammation, deodorizing, decoloring, or tissue activating with respect to various wounds by using a paste for coating, ointment, etc., filled with ozone.

[0021]

In this applied mode, easily producing an ozone-filled viscose material which maintains the aforementioned effects has become possible with said production device (1). In particular,

the ozone-filled viscose material produced with this production device (1) feeds and fills ozonized air in high-viscosity material (4) by being made into microbubbles according to the agitating operation of screw (19) so the ozone dissipation preventive effect is very high and the sustaining property of said effect has been enhanced. Consequently, the range of application thereof has increased considerably when compared with the conventional use as a gas or a liquid and application in various fields in addition to use in the aforementioned fields is possible. Also, the production device (1) was constituted to be able to adjust the rotating speed of screw (19) so production of a suitable ozone-filled viscose material has become possible by executing agitating operation according to the viscosity of high-viscosity material (4).

[0022]

The present invention is not restricted to the aforementioned applied mode and various changes are possible in a scope of not deviating from the purpose thereof. For example, in the aforementioned applied mode, it was constituted by screw (19) which received the output of motor (13) to rotate within container (3) as the agitating blade of production device (1) but it is possible to provide a screw within container (3) beforehand as a mixer, so that rotation is possible by interfitting with the motive power side provided to stage (5) according to mounting of the container. Also, the ozone-filled viscose material is produced under various conditions such as the viscosity of

high-viscosity material (4), concentration of the ozone, content of the ozone with respect to high-viscosity material (4), agitating time of production device (1), etc.

[0023]

Effect of the invention

The present invention fills an ozonized gas of concentration 0.01-500 ppm with respect to a high-viscosity material in which the viscosity is $1\text{-}10^6$ Pa·sec by dissolving it or making it into microbubbles, so providing an ozone-filled viscose material which continuously maintains the effects of the ozone such as disinfecting ability, etc., over a long period of time has become possible. Also, the present invention has an ozone generator which generates ozone, a container for filling a high-viscosity material, an ozone feed pipe which is extended into said container from the ozone generator, and an agitator which agitates the high-viscosity material within the container, so providing a production device for producing an ozone-filled viscose material which continues to maintain the effects of the ozone such as disinfecting ability, etc., over a long period of time has become possible.

Brief description of the figures

Figure 1 is conceptual diagram showing the constitution of an applied mode of an ozone-filled viscose material production device related to the present invention.

Figure 2 is a figure showing a state of having applied an ointment which is an ozone-filled viscose material filled with ozone by being made into microbubbles in the wound part, inflammation part, or the skin surface.

Figure 3 is a figure showing a state of having used a toothpaste filled with ozone which was made into microbubbles.

Figure 4 is an external perspective view showing a halitosis eliminating device.

Explanation of symbols

(1)...production device, (2)...main body, (3)...container, (4)...high-viscosity material, (5)...stage, (6)...supporting pillar, (7)...rail, (8)...drive part, (11)...ozone generator, (12)...power source, (13)...motor, (14)...rotating shaft, (15)...gear box, (16)...power switch, (18)...ozone feed pipe, (19)...screw.

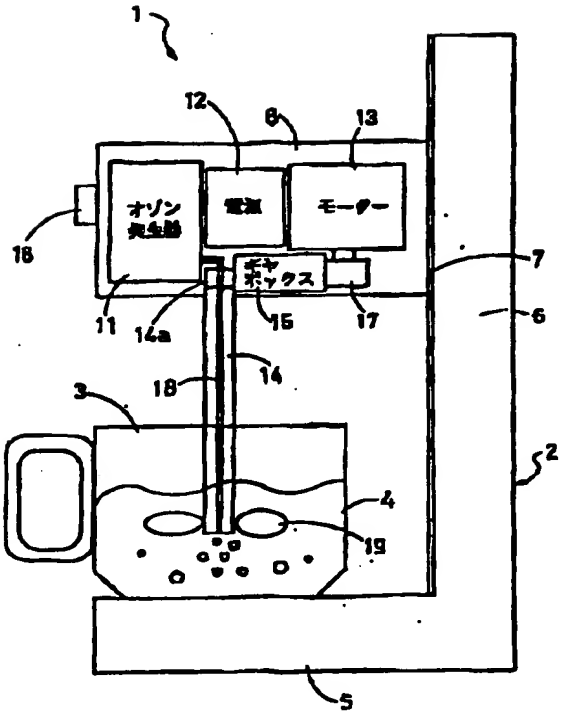

Figure 1

Key: 11 Ozone generator
12 Power source
13 Motor
15 Gear box

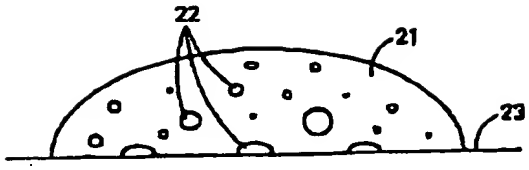

Figure 2

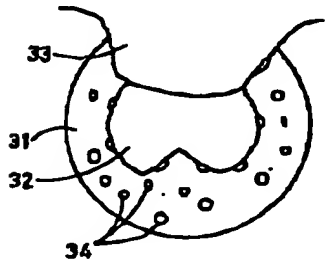

Figure 3

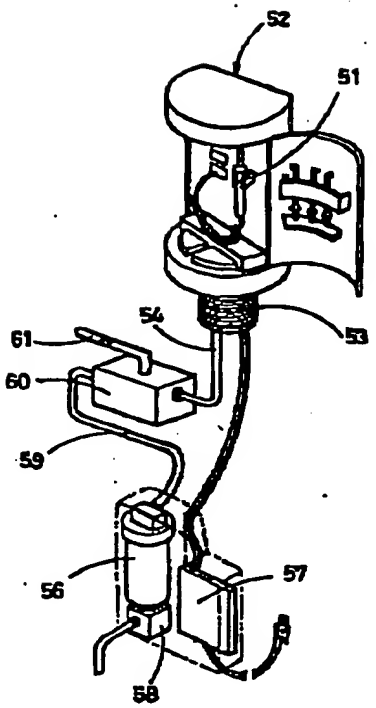

Figure 4